ACTION MEMORANDUM #2 FOR THE 300 AREA FACILITIES

1.0 PURPOSE

The purpose of this action memorandum is to document approval of the non-time critical removal action described herein for the 324 Building, 327 Building, and associated ancillary facilities, located in the 300 Area of the Hanford Site.

The removal action to be implemented for the 324 and 327 Buildings, and associated ancillary facilities, in the 300 Area is outlined in the *Engineering Evaluation/Cost Analysis #2 for the 300 Area* (EE/CA) (DOE-RL 2005a), which was prepared by the U. S. Department of Energy (DOE). The EE/CA evaluated removal actions for the 324 and 327 Buildings and associated ancillary facilities. The preferred removal action identified in the EE/CA was to deactivate, decontaminate, decommission and demolish the buildings. Waste generated from the removal action that meets Environmental Restoration Disposal Facility (ERDF) waste acceptance criteria will be disposed at ERDF.

The removal action minimizes the potential for a release of hazardous substances[1] from the facilities that could adversely impact human health and the environment, is protective of the site personnel and the environment, and contributes to the efficient performance of any remedial actions, including any future subsurface soil remediation. The action includes building contents, above-ground structures, on-grade floor slabs, and the below-grade foundations and piping.

A 30-day public comment and review period for the subject EE/CA was held from February 27 to April 3, 2006. The comment period was used to evaluate removal action alternatives for the facilities presented in the EE/CA as well as the facility specific information available in the Administrative Record. All comments received generally supported selection and implementation of the preferred removal alternative, which is to deactivate, decontaminate, decommission, and demolish the buildings. The comments and responses are provided in Appendix A.

2.0 SITE CONDITIONS AND BACKGROUND

There are approximately 200 facilities currently located within the 300 Area Complex. Many of these facilities are empty, while other facilities are used to support research and development (R&D) or landlord activities of the 300 Area. Years of reactor fuel fabrication and laboratory operations in the 300 Area Complex have left many of the facilities contaminated.

[1] "Hazardous substances" means those substances defined by the *Comprehensive Environmental Response, Compensation and Liability Act of 1980*, Section 101(14), and includes both radioactive and chemical substances.

In January 2005, the U. S. Environmental Protection Agency (EPA) and the U. S. Department of Energy, Richland Operations Office (DOE/RL) issued *Action Memorandum #1 for the 300 Area Facilities* (EPA 2005). The Action Memorandum established a non-time critical removal action to deactivate, decontaminate, decommission, and demolish 72 buildings and structures located in the 300 Area Complex. The buildings addressed in Action Memorandum #1 were grouped geographically to address the buildings and structures located north of Apple Street in the 300 Area. The buildings addressed in this removal action (Action Memorandum #2) were grouped together because they are similar in size and complexity. The *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology 2003) Milestone M-94-03 calls for final disposition of the 324, 324B, and 327 Buildings by September 2010.

An engineering evaluation to address the remaining buildings and structures located in the 300 Area Complex is under development.

2.1 BACKGROUND

In March 1943, construction of a nuclear fuel fabrication complex began at the Hanford Site in an area along the western bank of the Columbia River, approximately 12 km (7.5 mi) north of the city of Richland. This area was commonly referred to as the "300 Area". As a manufacturer of uranium fuel, the 300 Area housed the first essential step in the plutonium production process. Nuclear fuel was fabricated from uranium shipped in from offsite support facilities. In addition to housing the Hanford Site fuel fabrication plants, the 300 Area was the center of much of the site R&D projects. In connection with these activities, chemical process laboratories, test reactors, and numerous ancillary support structures were constructed. The addition of new research and laboratory facilities continued into the 1960's to support defense and energy research.

In November 1989, the 300 Area was one of four areas of the Hanford Site that were placed on the EPA National Priorities List (NPL) under the *Comprehensive Environmental Response, Compensation and Liability Act of 1980* (CERCLA). The 300 Area NPL site is subdivided into three operable units (OU) to address cleanup of the soil and groundwater contamination that resulted from past operations. The 300-FF-1 and 300-FF-2 OUs address contamination at liquid disposal sits, burial grounds, and most of the soil waste sites in the 300 Area NPL site. The 300-FF-5 OU addresses groundwater contamination beneath the burial grounds and other soil waste sites located within the geographical boundary of the 300 Area NPL site. Records of Decision have been issued for all three of the 300 Area OUs and remedial actions are ongoing, but the RODs do not address the buildings and associated ancillary facilities addressed by this Action Memorandum.

2.2 FACILITY DESCRIPTION

The facilities addressed in this action memorandum (Table 1) include a combination of testing facilities, storage buildings, and laboratories. A brief description of the facilities can be found in the *Engineering Evaluation/Cost Analysis #2 for the 300 Area* (DOE-RL 2005a). The 300-FF-2

waste sites that are present beneath and/or adjacent to the facilities included in this action memorandum are identified in Table 1. The proximity of the facilities to one another and to underlying or adjacent 300-FF-2 waste sites is depicted in Figures 1 and 2. The 324 Building Radiochemical Engineering Cells (REC) and the High-Level Vault/Low-Level Vault tanks will be closed as a directed *Resource Conservation and Recovery Act* (RCRA) storage unit closure in accordance with Tri-Party Agreement Milestone M-89-00.

Table 1. Facilities Addressed Under Action Memorandum #2

Facility	Name	Major Facilities[a]	Small Facilities[b]	Active Facility[c]
324	Waste Technology Engineering Laboratory	X		X
324A	Stack Monitoring Building		X	X
324B	Chemical Engineering Laboratory Exhaust Stack		X	X
324C	Experimental Lithium Enclosure		X	X
324D	Effluent Monitoring Station		X	X
324S	Wet Storage Basin		X	
3718E	Storage Building		X	X
3718G	Storage Building		X	X
327	Post Irradiation Test Laboratory	X		X
327 Stack	327 Stack		X	X
3723	Solvent and Acid Storage Building		X	X

[a] Major facilities are the larger, multi-room structures, generally with radiological and/or chemical contamination.
[b] Small facilities are small structures, generally with one to three rooms.
[c] Facility is actively being used as of autumn 2005.

2.3 SOURCE, NATURE, AND EXTENT OF CONTAMINATION

In general, the facilities addressed in this action memorandum are contaminated with CERCLA 101(14) hazardous substances associated with chemical processing and metallurgical engineering studies, testing irradiated fuel elements, and developing approaches for waste treatment and storage. To help identify hazardous substances, several sources of information were used, including historical operations information, radiological survey reports, vulnerability assessments, inspections, and knowledge of construction materials.

To the extent practicable, hazardous substances including bulk chemicals that are no longer in use have been, or will be, removed from the facilities during routine operations and surveillance and maintenance (S&M). However, residual contamination remains or will remain on facility surfaces (including the roof), in piping and ductwork, and in structural materials.

In general, the primary contaminants of concern are the following radionuclides:

- Americium-241
- Cesium isotopes
- Cobalt-60
- Curium isotopes
- Europium isotopes
- Niobium-94
- Radium-226
- Selenium-79
- Strontium-90
- Plutonium isotopes
- Technetium-99
- Thorium isotopes
- Uranium isotopes.

The facilities also contain nonradioactive hazardous substances, as either contaminants from operations or components of structural materials. The contaminants that could potentially be present in one or more of the facilities are as follows:

- Asbestos
- Cadmium
- Chromium
- Beryllium
- Lead
- PCBs
- Mercury (in electrical switches)
- Refrigerants (freon)
- Lubricants
- Commercial solvents
- Corrosives
- HEPA filter media (desiccants)
- Sodium vapor and mercury vapor lighting.

Characterization will be conducted as part of the removal action activities in accordance with approved sampling and analysis plans. The characterization information will be used to support waste designation, which may include nondestructive assay, and to determine if the removal action objectives have been met. Characterization data will also be used to determine whether any contamination remaining after facility removal should be identified as a waste site to be incorporated into the 300-FF-2 OU for subsequent remedial action.

2.4 THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT

The 324 and 327 facilities are known to be contaminated with radioactive and non-radioactive hazardous substances. Radiological hazard analyses conducted by the DOE for the 324 and 327 Buildings demonstrated a need for active controls to protect human health and the environment. The primary controls are the integrity of the facility structures and zoned ventilation systems. The following discussion provides a qualitative discussion of the risks.

The major contaminants of concern at the facilities addressed in this action memorandum are radionuclides, when above acceptable levels are known to be carcinogenic and/or hazardous to human health and the environment. While the levels or radioactive contamination in the 324 and 327 facilities remain significant, many of the ancillary facilities may contain low levels of radioactive contamination as surface contamination or as a part of the structural material. Hazardous substances including asbestos insulation, heavy metals (such as mercury in switches and lead shielding), and PCBs in building materials are also present in the facilities.

A security fence and signage currently surrounds the area to limit unauthorized entrance. In addition, the facilities are locked and require approval prior to entry. As long as DOE retains control of the 300 Area, these access controls would help prevent direct contact and exposure to the hazardous materials. However, access controls will not prevent deterioration of the facilities or reduce the threat of release or hazardous substances to the environment over the long term. Hazardous substances could be released directly to the environment via a breach in a pipe, containment wall, or other physical control failures as the facilities age and deteriorate. Hazardous substances could also be released to the environment through animal intrusion into the contaminated structures and systems. Historically, intrusion and spread of contamination by rodents, insects, birds, and other organisms has been difficult to control and prevent.

As the facilities continue to age, the threat of a release of hazardous substances from facility deterioration and animal intrusion increases, and it becomes more difficult to confine these materials from the environment. The S&M activities required to confine the hazardous substances may increase the risk of potential exposure to personnel. Also, potential releases from waste sites underneath and next to the facilities addressed herein pose a significant risk to human health and the environment as described in the 300-FF-2 feasibility study (DOE/-RL 2000). Removal of the facilities addressed in this action memorandum is needed, in some instances, to facilitate remediation of adjacent or underlying waste sites.

2.5 OTHER ACTIONS TO DATE

The 300-FF-2 Operable Unit contains 56 waste sites. Forty of these waste sites are located beneath existing facilities and/or covered areas inside the 300 Area industrial complex fences. The 300-FF-2 ROD was issued in April 2001 (EPA 2001). The selected remedy requires removal of contaminated soil, structures and associated debris; treatment if necessary to meet the waste acceptance criteria of the acceptable disposal facility; and disposal in ERDF, the Waste Isolation Pilot Plant, or other disposal facilities approved by EPA.

Cleanup activities for waste sites within the 300 Area complex are being conducted (in most cases) after the demolition of structures above and adjacent to the waste sites. Nearly 150 buildings and structures, including some of the buildings addressed by this action memorandum, will have to be removed from before the cleanup of waste sites beneath them can be completed

3.0 THREATS TO HUMAN HEALTH AND THE ENVIRONMENT

Conditions persist wherein threats to the public health or the environment exist.

The *National Oil and Hazardous Substance Pollution Prevention Contingency Plan* (NCP), 40 *Code of Federal Regulations* (CFR) 300.415(b)(2), establishes factors to be considered in determining the appropriateness of a removal action. Those factors include the following:

- *Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants.* Hazardous substances, including radionuclides, are present as contamination within the cells, equipment, and additional structures. There is an increasing threat of release of these hazardous substances to humans and ecological receptors as the facilities continue to deteriorate with age. As contamination becomes exposed and as structural integrity is compromised, the potential direct exposure (i.e., inhalation of contaminated dust and debris, direct contact with contaminated debris, etc.) of nearby personnel and the environment, and exposure to the public through airborne radioactive contaminants increases. In addition, the S&M activities required to maintain confinement of the building and additional structures increasingly pose a potential exposure to the environment.

- *Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.* The potential for wind or precipitation-related releases of hazardous substances within the facilities increases as the facilities continue to deteriorate with age.

- *Hazardous substances or pollutants or contamination in barrels, tanks, or other bulk storage containers that may pose a threat of release.* Hazardous substances, including radioactive substances, are contained within the pipes and vessels of the facilities addressed in this action memorandum. These substances pose a threat of accidental release that may result from container deterioration or animal intrusion.

The external radiation, inhalation, and ingestion risks to the site workers, the public, and ecological receptors associated with potential releases of contamination under a continued S&M scenario justify a non-time-critical removal action.

4.0 ENDANGERMENT DETERMINATION

The selected response action is necessary to protect the public health or welfare or the environment from the actual or substantial threat of a release of hazardous substances, including radioactive substances from the facilities into the environment. Actual or threatened release of hazardous substances from the 324 Building, 327 Building, and associated ancillary facilities may present imminent and substantial endangerment to public health or welfare or the environment.

5.0 PROPOSED ACTIONS AND ESTIMATED COSTS

Proposed actions and estimated costs are presented in the following sections.

5.1 PROPOSED ACTION

An EE/CA was prepared to develop removal action alternatives for the 324 and 327 buildings, and associated ancillary facilities. The scope of this removal action addresses only the buildings and associated ancillary facilities themselves. The soil underlying some of the facilities may also be contaminated. Where there is previous knowledge of such contamination, the soil has already been identified as a separate waste site and will be remediated under the CERCLA 300-FF-2 OU interim ROD. If new contamination is identified in the future, it will be noted within the Waste Information Data System (WIDS) and addressed under the 300-FF-2 OU remediation process or other soil remediation activity.

The removal action alternatives evaluated for the facilities must meet the removal action objectives. The specific removal action objectives for this response action are as follows:

- Protect human receptors from exposure to hazardous substances in facility structures above acceptable exposure levels for employees
- Control the release of hazardous substances from the facilities into the environment
- Facilitate remediation of 300 Area waste sites in accordance with the 300-FF-2 OU interim action record of decision (ROD) (EPA 2001)
- Achieve applicable or relevant and appropriate requirements (ARARs) to the fullest extent practicable
- Safely treat, as appropriate, and dispose of waste streams generated by the removal action.

Based on these considerations, the following three removal actions are identified:

- Alternative 1: No action
- Alternative 2: Deactivation, Decontaminate, Decommission, and Demolish (D4)
- Alternative 3: S&M followed by D4

5.1.1 Alternative 1: No action

Under the no action alternative, Hanford Site access controls would be maintained to help prevent worker or public entry to the contaminated facilities. No other specific controls would be established for the facilities. Risks over time are expected to increase as facility deterioration progresses and structural integrity is compromised. The no action alternative does not address the hazards posed by the facilities, which will increase as the facilities continue to deteriorate. Eventually, decay is expected to result in radiological releases to the environment and potential exposure to personnel, the public, and environmental receptors. Physical hazards associated with partial structure collapse also are anticipated.

In addition, the no action alternative would impede remedial action progress for the 300-FF-2 OU waste sites located in the geographical area.

5.1.2 Alternative 2: Deactivation, Decontaminate, Decommission, and Demolish (D4)

The objective of the D4 alternative is to demolish the structures and eliminate the threat of release of hazardous substances. The action includes deactivating the facilities by removing physical, chemical, and radiological barriers to demolition. Decontamination of the remaining facility would be performed to meet waste acceptance criteria for ERDF or other approved waste management facilities. Then, permanent utilities and services would be discontinued as part of facility decommissioning. Finally, the buildings and structures would be demolished; and materials would be disposed at the Environmental Restoration Disposal Facility (ERDF) or other facility in accordance with waste acceptance criteria. The D4 alternative would initiate the process of demolishing the 324 and 327 Buildings, and associated ancillary facilities, in the near future. Work would be completed no later than September 30, 2010, to support Tri-Party Agreement Interim Milestone M-94-03.

The majority of the facility demolition would require the use of heavy equipment (e.g., excavator with various attachments) to demolish structures. Other industry standard practices for demolition also might be used (e.g., mechanical saws and cutting torches). Special removal techniques may be required for the 324 hot cells due to their size. Except as provided below, below-grade structures (e.g., slab, basement, and foundation) would be demolished and removed. Approximately 1 meter of surrounding soil will be removed and disposed with the building material. On a case-by-case basis, in accordance with the approved work plan, the facility slab or foundation may be left in place where the facilities are located above or adjacent to known or suspected 300-FF-2 OU waste sites to provide additional intrusion or infiltration protection pending initiation of waste site remediation. In these instances, clean fill/soil or other barrier may be placed over the remaining contamination in accordance with an EPA-approved work plan.

5.1.3 Alternative 3: Long-Term Surveillance and Maintenance Followed by D4

The objective of long-term S&M is to sustain the buildings and structures in a safe condition for up to 6 years before initiating the demolition process. To the extent possible, S&M would be performed to minimize the potential for an environmental release and to protect workers while maintaining compliance with applicable state and federal regulations and DOE orders. During the S&M phase, existing access controls would be maintained to warn workers of potential hazards and restrict public access to the 300 Area. Major repairs such as re-roofing and shoring structural components, would be performed only as necessary to ensure facility integrity for containment of hazardous materials.

In general, as facilities age and deteriorate, S&M must become more aggressive over time, and worker safety is a critical factor. Without an increasingly aggressive S&M program, the threats associated with unplanned releases to the environment and injury or exposure to workers would increase. Conversely an aggressive S&M program would require more frequent worker entry into the facilities to perform more invasive maintenance procedures, which would increase the potential for exposure to workers. In addition, personal protection requirements to maintain a more aggressive program could continually increase, which would add to the cost.

Following the S&M phase of this alternative, the facilities would still need to undergo deactivation, decontamination, decommissioning, and demolition. The D4 phase of the alternative is assumed to be performed as described in Section 5.1.2. Although this alternative would not satisfy the TPA Interim Milestone M-94-03, this alternative would meet the requirement of Tri-Party Agreement Major Milestone M-94-00 to complete disposition of 300 Area surplus facilities by September 2015.

5.2 WASTE MANAGEMENT CONSIDERATIONS FOR ALTERNATIVES

With the exception of the no action alternative, each of the alternatives results in the generation of waste requiring appropriate disposal. The majority of the contaminated debris will likely designated as low-level waste (LLW); however, quantities of mixed waste, dangerous waste, and transuranic (TRU) waste might be generated. Waste management ARARs are discussed in Section 5.3.

Contaminated waste for which no reuse, recycle, or decontamination option is identified would be characterized and assigned an appropriate waste designation (e.g., solid, asbestos, PCB, radioactive, dangerous, mixed). Most of the contaminated waste generated during implementation of these alternatives would be disposed onsite at the ERDF near the 200 West Area. The ERDF is the preferred waste disposal option because the ERDF is an engineered facility that provides a high degree of protection to human health and the environment, and previous EE/CAs for other Hanford Site facilities have shown that this disposal option is more cost effective than disposal at other disposal sites. Construction of ERDF was authorized using a separate CERCLA ROD (EAP 1995). The ERDF is designed to meet minimum RCRA

technological requirements for landfills, including standards for double liner, a leachate collection system, leak detection, monitoring, and a final cover.

In 1996, an explanation of significant difference (ESD) (Ecology et a. 1996) clarified the ERDF ROD (EPA 1995) for eligibility of waste generated during Hanford Site cleanup activities for ERDF disposal. In accordance with the ESD, any low-level waste, mixed waste, and hazardous/dangerous waste generated as a result of CERCLA or RCRA cleanup actions (e.g., D&D, RCRA past-practice, and investigation-derived waste) is eligible for ERDF disposal, provided that appropriate CERCLA decision documents are in place and that the waste meets ERDF waste acceptance criteria (BHI 2002). The waste that would be generated under these alternative CERCLA removal actions falls within the definition of waste eligible for disposal at ERDF.

While most waste generated during the removal action is anticipated to meet ERDF waste acceptance criteria, some waste may require treatment to meet ERDF waste acceptance criteria or RCRA land disposal restrictions. The type of treatment and the location of treatment would be conducted in accordance with the EPA-approved work plan. In most cases, the type of treatment anticipated would consist of solidification/stabilization techniques such as macroencapsulation or grouting. Specifically, this includes low-level radioactive and nonradioactive liquid waste.

Liquid waste containing levels of radioactive and/or nonradioactive hazardous substances meeting the 200 Area Effluent Treatment Facility (ETF) waste acceptance criteria would be transferred to the ETF and treated to meet ETF waste discharge criteria. Liquids that do not meet ETF waste acceptance criteria would be treated to meet land disposal restrictions. Secondary waste generated from ETF treatment would either be disposed at ERDF (if ERDF waste acceptance criteria are met) or stored at the Central Waste Complex (CWC) or another approved storage facility, subject to final disposition under this CERCLA removal action. Management of the waste at these units would be in accordance with applicable requirements, including any permit requirements. Uncontaminated water (e.g., nonradioactive and nonhazardous) could be used for dust suppression.

If TRU waste is encountered, it would be placed in interim storage at the Waste Receiving and Processing Facility Module 1 (WRAP) or the CWC, subject to final disposition under this CERCLA removal action. Transuranic waste will ultimately be shipped offsite to the Waste Isolation Pilot Plant (WIPP) in accordance with an approved work plan and the schedule established for completing remedial actions no later than September 30, 2024. Management of the waste at these units would be in accordance with applicable requirements, including any permit requirements.

Of the above Hanford Site storage, treatment, and disposal options, only the ERDF is considered to be "onsite" for management and/or disposal of waste from removal actions proposed in this

document[2]. There is no requirement to obtain a permit to manage or dispose of CERCLA waste at the 324 Building, the 327 Building, the associated ancillary facilities, or at the ERDF. It is expected that the great majority of the waste generated during the removal action proposed in this document can be disposed at the ERDF. For waste that must be sent elsewhere, other than TRU waste, the U. S. Environmental Protection Agency (EPA) would make a determination in accordance with 40 CFR 300.440 as to the acceptability of the proposed site for receiving this CERCLA removal action waste. The EPA has already made this determination for the WIPP disposal of TRU waste. Residuals from an offsite treatment of waste originating from facilities addressed by Action Memorandum can be disposed at ERDF providing the treatment residuals meet the ERDF waste acceptance criteria.

5.3 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND OTHER CRITERIA, ADVISORIES, OR GUIDANCE TO BE CONSIDERED

40 *Code of Federal Regulations* (CFR) 300.415(j) requires that removal actions attain applicable or relevant and appropriate requirements (ARARs) to the extent practicable, considering the exigencies of the situation. When requirements are identified, a determination must be made as to whether those requirements are applicable or relevant and appropriate. A requirement is applicable if it specifically addresses a hazardous substance, pollutant or contaminant, remedial action, location or other circumstance at the site. If not applicable, a requirement may nevertheless be relevant and appropriate if it addresses problems or situations sufficiently similar to the problems or situations encountered and their use is well suited to the site.

ARARs include only substantive requirements of environmental standards. ARARs do not include administrative requirements, including requirements to obtain any federal, state, or local permits (40 CFR 300.400(e) and 42 U.S.C. 9621 (e)).

To-be-considered (TBC) information consists of nonpromulgated advisories or guidance issued by federal or state governments that are not binding legally and do not have the status of ARARs. As appropriate, TBCs should be considered in determining the removal action necessary for protection of human health and the environment. Requirements drawn from TBCs may be included in the selected alternative.

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[2] CERCLA Section 104(d)(4) states that, where two or more noncontiguous facilities are reasonably related on the basis of geography, or on the basis of the threat or potential threat to the public health and welfare or the environment, the President may, at his discretion, treat these facilities as one for the purpose of this section. The preamble of the "National Oil and Hazardous Substances Pollution Contingency Plan" (40 CFR 300) clarifies the stated EPA interpretation that when noncontiguous facilities are reasonably close to one another, and wastes at these sites are compatible for a selected treatment or disposal approach, CERCLA Section 104(d)(4) allows the lead agency to treat these related facilities as one site for response purposes and, therefore, allows the lead agency to manage waste transferred between such noncontiguous facilities without having to obtain a permit. Therefore, the 300 Area NPL site and the ERDF are considered to be onsite for response purposes under this removal action. It should be noted that the scope of work covered in this removal action is for facilities and waste contaminated with hazardous substances. The DOE will disposition materials encountered during implementation of the selected removal action that are not contaminated with hazardous substances under non-CERCLA authority.

Because the alternatives would result primarily in waste generation and potential for air emissions, the key ARARs identified for the alternatives considered include waste management standards, standards controlling releases to the environment, standards for protection of natural resources, and safety and health standards[3]. The ARARs are discussed in the following sections. Off site management would require compliance with all applicable, substantive, and administrative requirements.

5.3.1 Waste Management Standards

A variety of waste streams would be generated under the proposed removal action alternatives. It is anticipated that most of the waste will designate as LLW. However, quantities of TRU waste, dangerous or mixed waste, and asbestos-containing material also could be generated. The great majority of the waste will be in a solid form. However, some aqueous solutions might be generated.

Waste designated as LLW that meets ERDF waste acceptance criteria (BHI 2002) would be disposed at the ERDF, which is engineered to meet relevant and appropriate performance standards under 10 CFR 61. If TRU waste is encountered, it would be placed in interim storage at the Waste Receiving and Processing Facility, Module 1 (WRAP) or the CWC and shipped offsite to the Waste Isolation Pilot Plant (WIPP) in accordance with the WIPP waste acceptance criteria.

The identification, storage, treatment, and disposal of the hazardous component of mixed wastes are governed by RCRA. Washington State, which implements RCRA requirements under WAC 173-303, has been authorized to implement most elements of the RCRA program. The dangerous waste standards for generation, treatment, storage, and disposal are applicable to the management of any dangerous or mixed waste generated under this action. The REC closure will be performed in satisfaction of the closure requirements of WAC 173-303-610. Treatment standards for dangerous or mixed waste subject to RCRA land disposal restrictions are specified in WAC 173-303-140, which incorporates 40 CFR 268 by reference. Waste that does not qualify for disposal in ERDF will be disposed of at an off site facility approved by EPA in accordance with 40 CFR 300.440. Off site disposal will be performed in accordance with an EPA approved work plan.

Waste designated as dangerous or mixed waste would be treated as appropriate to meet land disposal restrictions and ERDF acceptance criteria, and disposed at ERDF. ERDF is engineered to meet minimum RCRA technological requirements for landfills, including standards for double liner, a leachate collection system, leak detection, monitoring, and a final cover. All applicable packaging and pre-transportation requirements for dangerous and mixed waste generated under this action would be identified and implemented before movement of any waste.

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[3] Safety standards are not environmental standards per se and therefore are not potential ARARs. Instead, compliance with applicable safety regulations, such as OSHA requirements, is required external to the CERCLA ARAR process. However, due to the nature and importance of these standards, a discussion of the safety requirements is included in the action memorandum.

Some of the aqueous waste designated as LLW, dangerous, or mixed waste may be transported to ETF for treatment and disposal. ETF is a RCRA-permitted facility authorized to treat aqueous waste streams generated on the Hanford Site and dispose of these streams at a designated state-approved land disposal facility. Such treatment would be conducted in accordance with ETF permits and all other applicable requirements, and in accordance with the EPA approved work plan.

The management and disposal of PCB waste are subject to the *Toxic Substances Control Act of 1976* (TSCA) and regulations at 40 CFR 761. The TSCA regulations contain specific provisions for PCB waste, including PCB waste that contains a radioactive component. PCBs also are considered underlying hazardous constituents under RCRA and thus could be subject to WAC 173-303 and 40 CFR 268 requirements. Offsite treatment and/or disposal would require an offsite acceptability determination from EPA in accordance with 40 CFR 300.440. Waste designated as PCB remediation waste likely would be disposed at the ERDF. All waste suspected to contain PCBs would be evaluated to determine whether the waste meets ERDF acceptance criteria. Any PCB waste that does not meet ERDF acceptance criteria would be retained and managed at a PCB storage area meeting the requirements of TSCA storage until disposed of at an appropriate disposal facility, in accordance with the EPA approved work plan.

Removal and disposal of asbestos and asbestos-containing material are regulated under the *Clean Air Act of 1977* (40 CFR 61, Subpart M). The 40 CFR 61 requirements applicable to this removal action are contained in 40 CFR 61.145(a), 40 CFR 61.145(c), and 40 CFR 61.150. These regulations also specify handling, packaging, and disposal requirements for regulated sources having the potential to emit asbestos. Substantive requirements of these standards are applicable because this removal action includes abatement of asbestos-containing materials. Asbestos and asbestos-containing material would be removed, packaged as appropriate, and disposed at ERDF.

The *Hazardous Materials Transportation Act of 1974* (49 U.S. C. 1801-1813), as implemented by the "U.S. Department of Transportation Requirements for Transportation of Hazardous Materials" (49 CFR 100 through 179), governs the transportation of potentially hazardous materials, including samples and waste. These requirements are not ARARs, but would have to be met where applicable for any wastes or contaminated samples that would be shipped from the 300 Area in commerce and over public roads.

This removal action will be performed in compliance with all above waste management ARARs. All waste streams will be evaluated, designated, and managed in compliance with the ARAR requirements. Before disposal, waste will be managed in a protective manner to prevent releases to the environment or unnecessary exposure to personnel. Details on how compliance with ARARs will be achieved during implementation of the removal action will be contained in the removal action work plan.

5.3.2 Standards Controlling Airborne Emissions to the Environment

The proposed removal action alternatives would have the potential to generate both radioactive and nonradioactive airborne emissions.

The federal *Clean Air Act* and the "Washington Clean Air Act" (*Revised Code of Washington* [RCW] 70.94) regulate both criteria/toxic and radioactive airborne emissions. Implementing regulations found in 40 CFR 61.92 sets limits for emissions of radionuclides. Radionuclide emissions can not exceed those amounts that would cause any member of the public to receive an effective dose equivalent of 10 mrem/yr. This requirement is applicable because there is the potential to emit radionuclides to unrestricted areas from the removal action. WAC 173-480-070 requires verification of compliance with this standard.

Radioactive air emissions are to be controlled through the use of best available radionuclide control technology (WAC 246-247-040(3)) or as low as reasonable achievable control technology (WAC 246-247-040(4)). Emissions of radionuclides are to be measured for point sources (40 CFR 61.93) and for non-point sources (WAC 246-247-075(8)). Measurement techniques may include, but are not limited to, sampling, calculation, or smears for identifying emissions and will be outlined in the approved Air Monitoring Plan. The substantive requirements of these regulations are applicable because fugitive, diffuse, and point source emissions of radionuclides to the ambient air may result from activities performed during the removal action.

Conditions and limitations for the control and monitoring of radioactive emissions from the 324 and 327 Buildings are currently incorporated into the Hanford Site Air Operating Permit. The substantive requirements from the regulations cited above will be incorporated into the removal action work plan (RAWP) for this removal action[4]. The terms and conditions contained in the Washington State Department of Health License and the Hanford Site Air Operating Permit for these two facilities will no longer apply once the removal action is initiated under an EPA approved Air Monitoring Plan.

WAC 173-400 and 173-460 establish requirements for emissions of criteria/toxic air pollutants. The primary source of emissions resulting from this removal action would be fugitive particulate matter. Requirements applicable to this removal action are contained in WAC 173-400-040(3) and (8). These regulations require that reasonable precautions be taken to: 1) prevent the release of air contaminants associated with fugitive emissions resulting from materials handling, demolition, and other operations; and 2) prevent fugitive dust from becoming airborne from fugitive sources of emissions.

WAC 173-460 would be applicable to removal actions that require the use of a treatment technology that emits toxic air pollutants. Treatment of some waste may be required to meet the ERDF waste acceptance criteria. In most cases, the type of treatment anticipated would consist

[4] Pursuant to section 121(e)(1) of CERCLA, the permit does not apply to CERCLA removal action conducted entirely on site pursuant to a CERCLA Action Memorandum, work plan, or sampling and analysis plan.

of solidification/stabilization techniques such as macroencapsulation or grouting, and WAC 143-460 would not be considered an ARAR because it would not result in the emission of toxic air pollutants. No treatment requirements have been identified at this time that would be required to meet the substantive applicable requirements of WAC 173-460. However, if unknowns are encountered, that require more aggressive on-site treatment, resulting in the emission of toxic air pollutants, the substantive requirements of WAC 173-460-030, WAC 173-460-060, and WAC 173-460-070 would be satisfied if the requirements are applicable or relevant and appropriate, as specified in EPA approved work plan.

5.3.3 Standards for Protection of Cultural and Natural Resources

The *Archeological and Historic Preservation Act of 1974* (16 U.S.C. 469-469c) provides for the preservation of historical and archeological data (including artifacts) that might be irreparably lost or destroyed as the result of a proposed action. Although the removal action will occur in previously disturbed areas and the discovery of artifacts is unlikely, this law would be applicable to any significant artifacts that may be discovered.

The *Native American Graves Protection and Repatriation Act of 1990* (as implemented by 43 CFR 10) requires agencies to notify and consult culturally affiliated tribes when Native American human remains are inadvertently discovered during project activities and to seek ways to protect or repatriate the human remains. It is unlikely that work proposed in this removal action would inadvertently uncover human remains. If human remains were encountered, the procedures documented in the *Hanford Cultural Resources Management Plan* (DOE/RL 2003) would be followed to satisfy substantive requirements.

The *National Historic Preservation Act of 1966* (as implemented by 36 CFR 800) requires Federal agencies to evaluate historic properties for *National Register for Historic Places* (NPS 1988) eligibility, and to mitigate adverse effects of Federal activities on any site eligible for listing in the Register. Physical effects (i.e. demolition of the building structure) to all properties addressed in this removal action have been mitigated through documentation. However, tagged artifacts within the 327 Building will either be retrieved and transported to an appropriate curation facility identified by DOE or recorded in place through photography or other appropriate means prior to demolition.

The *Endangered Species Act of 1973* and WAC 232-012-297 require the conservation of critical habitat on which endangered or threatened species depend and prohibit activities that threaten the continued existence of listed species or destruction of critical habitat. The *Migratory Bird Treaty Act of 1918* makes it illegal to remove, capture, or kill any migratory bird or any part of nests or the eggs of any such birds. Although adverse impacts to endangered or threatened species or migratory birds are not expected, activity specific ecological reviews will be conducted to identify and mitigate any potentially adverse impacts prior to beginning field work.

5.3.4 Safety and Health Standards

Worker safety requirements are not potential ARARs under CERCLA but must be met. The DOE radiation protection standards, limits, and program requirements for protecting workers from ionizing radiation are specified in "Occupational Radiation Protection" (10 CFR 835). The rule also requires that measures be taken to maintain radiation exposures as low as reasonably achievable. In addition, DOE must meet Occupational Safety and Health Administration requirements for worker protection (e.g., 29 CFR 1910 and 29 CFR 1926), national consensus standards, and DOE orders. Exposure limits, personnel protection requirements, and decontamination methods for hazardous chemicals are established by 29 CFR 1910. Identification and mitigation of physical hazards posed by a facility including (but not limited to) confined spaces, falling hazards, fire and electrical shock are also required. 29 CFR 1926 provides requirements for worker safety during construction activities. The applicable DOE orders require analysis of hazards posed by work activities and identification of controls necessary to work safely.

Under Alternatives 2 and 3 of the EE/CA, radiological and physical hazards would be identified and analyzed prior to the start of field activities, and appropriate measures for mitigation would be addressed in a task-specific health and safety plan. A combination of personal protective equipment, personnel training, and administrative controls (e.g., limiting time in, and distance from, radiation zones) would be used to ensure that the requirements for worker protection are met. Individual monitoring would be performed, as necessary, to verify compliance with the requirements.

5.3.5 Standards for Controlling Stormwater Discharges

Stormwater runoff from some of the facilities listed in this action memorandum discharges to engineered structures (e.g., french drains). These drains are registered pursuant to WAC 173-218. A Hanford Site-Wide State Waste Discharge Permit issued pursuant to WAC 173-216 addresses discharges of stormwater to engineered structures. Substantive provisions of the permit include implementation of best management practices and meeting the Groundwater Quality Criteria (WAC 173-200). The practices and controls to be implemented will be described in the removal action work plan as approved by the EPA. This could include eliminating or rerouting stormwater discharges or creating new discharge locations.

5.4 ESTIMATED COSTS

The following is a summary of estimated costs for the alternatives considered in the EE/CA. The near-term costs for implementing the no action alternative are negligible as no new costs are expected for such things as security, radiological surveys, or maintenance activities; therefore, costs for the no action alternative are not included.

Present-worth and nondiscounted cost estimates for the three alternatives are shown in Table 2. Individual cost estimates for performing alternatives two and three are provided in the

Engineering Evaluation/Cost Analysis #2 for the 300 Area (DOE-RL 2005a) in Tables 4-1 and 4-2, respectively. Consistent with guidance established by the EPA and the U.S. Office of Management and Budget (OMB), present-worth analysis is included as a basis for comparing costs of cleanup alternatives under the CERCLA Program (EPA 1993). Present-worth (discounted) cost values were calculated using the real interest rate on treasury notes and bonds from OMB Circular A-94 Appendix C (OMB 1992).

The summarized estimate is shown in Table 2, which includes a projection of the total nondiscounted cost for implementing facility Deactivation, Decontamination, Decommissioning, and Demolition (D4) (Alternative 2) for the facilities included in the scope of this action memorandum, which would be $61.7 million based on present day (2005) dollars. The nondiscounted cost is the total cost without any adjustment based on an assumed interest rate over the duration of the project. The present-worth (discounted) cost is $59.9 million based on a discount rate of 2.0% over the assumed 5-year duration of D4.

The total projected nondiscounted cost for implementing S&M followed by D4 alternative (Alternative 3) for the facilities included in the scope of this action memorandum would be $93.5 million based on present-day (2005) dollars (Table 2). The present-worth (discounted) cost is $81.2 million and is assumed to increase in value at a rate of 2.5% over the 9-year duration.

Table 2. Total Costs for Removal Action Alternatives for the 324 and 327 Buildings, and associated Ancillary Structures [a, b]

Alternative Description Facility Name	Nondiscounted Cost ($k)[d]			Present-Worth Cost ($K)
	S&M[c]	D4	Total	
Alternative #1: No Action	-0-	-0-	-0-	-0-
Alternative #2: D4	N/A	$61,705	$61,705	$59,914[e]
Alternative #3: Long-term surveillance and maintenance followed by D4	$31,812	$61,705	$93,517	$81,227[f]

[a] All costs are 2005 dollars based on current project estimates. D&D costs include estimated ERDF disposal costs.

[b] The Tri-Party Agreement Milestone M-094-03 date for completion of deactivation/D&D is September 30, 2010.

[c] Annual S&M costs are based on FY 2005 actual costs of $3,987K for the 324 facility and $1,315K for the 327 facility.

[d] The nondiscounted cost is the total cost without any adjustment based on an assumed discount rate over the duration of the project.

[e] The present-worth discount rate is assumed to be 2.0% over the assumed 5-year duration of the project. The discount rate used is the 5-year value of 2.0% is from OMB Circular A-94, Appendix C (OMB 1992). This value was published in 2005 and is valid through January 2006.

[f] The present-worth discount rate is assumed to be 2.5% over the assumed 9-year duration of the project. The discount rate used is the 10-year value of 2.5% is from OMB Circular A-94, Appendix C (OMB 1992). This value was published in 2005 and is valid through January 2006.

5.5 PROJECT SCHEDULE

This removal action is scheduled to begin in 2006. The removal action work plan, which includes an air monitoring and waste management plan, will be submitted to EPA for review and approval and will be implemented as written and approved. The existing *300 Area D&D Waste Sampling and Analysis Plan* (DOE-RL 2005c) will be used to perform removal activities associated with this action memorandum; and appended to include a sampling and analysis plan for performing sampling of the hot cells.

6.0 EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Severe weather can create facility conditions amenable to radiological releases, and long-term aging of engineered controls can lead to eventual failure. Additionally, failure to remove certain facilities precludes cost effective remediation of underlying or adjacent waste sites in accordance with the 300-FF-2 ROD. These conditions could result in an unplanned release. This may cause a threat to human health and the environment by direct exposure to nearby personnel and the environment, and exposure to the public through airborne radioactive contaminants.

7.0 OUTSTANDING POLICY ISSUES

There are no outstanding policy issues for this removal action.

8.0 SELECTED ALTERNATIVE

The selected removal action alternative for the facilities included in this action memorandum is D4 (Alternative 2). This alternative provides increased protection to human health and the environment and is effective in maintaining that protection in both the short term and long term. The alternative removes the threat of release of radiological and non-radiological hazardous substances to the environment resulting from facility deterioration or animal intrusion; and reduces potential exposure to personnel caused by continued surveillance and maintenance of aging facilities. In addition, removal of the associated buildings contributes to the efficient performance of long term remedial actions for the 300-FF-2 OU.

This Action Memorandum represents the selected removal action for the 324 and 327 Buildings, and associated ancillary facilities and was developed in accordance with CERCLA, as amended, and is consistent with the NCP. This decision is based on information provided in the Administrative Record for this project.

9.0 REFERENCES

10 CFR 61, "Licensing Requirements for Land Disposal of Radioactive Waste," *Code of Federal Regulations*, as amended.

10 CFR 835, "Occupational Radiation Protection," *Code of Federal Regulations*, as amended.

29 CFR 1910, "Occupational Safety and Health Standards," *Code of Federal Regulations,* as amended.

29 CFR 1926, "Safety and Health Regulations for Construction," *Code of Federal Regulations,* as amended.

40 CFR 61, "National Emission Standards for Hazardous Air Pollutants," *Code of Federal Regulations,* as amended.

40 CFR 268, "Land Disposal Restrictions," *Code of Federal Regulations,* as amended.

40 CFR 300, "National Oil and Hazardous Substances Pollution Contingency Plan," *Code of Federal Regulations,* as amended.

40 CFR 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions," *Code of Federal Regulations,* as amended.

49 CFR 179, "Transportation," *Code of Federal Regulations,* as amended.

BHI, 2002, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*, BHI-00139, Rev. 4, Bechtel Hanford, Inc., Richland, Washington.

Clean Air Act Amendments of 1977, Public Law 95-95, 301(b), 91 Stat. 685, 770.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. 103, as amended.

DOE-RL, 2003, *Hanford Cultural Resources Management Plan*, DOE/RL-98-10, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2005a, *Engineering Evaluation/Cost Analysis #2 for the 300 Area*, DOE/RL-2005-84, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2005b, *324 Building Radiochemical Engineering Cells, High-Level Vault, Low-Level Vault, and Associated Areas Closure Plan*, DOE/RL-96-73, Rev. 3, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2005c, *300 Area D&D Waste Sampling and Analysis Plan,* DOE/RL-2004-84, Rev 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Ecology, EPA, and DOE, 1996, *U.S. Department of Energy Hanford Environmental Restoration Facility, Hanford Site, Benton County, Washington, Explanation of Significant Difference (ESD)*, Washington Sate Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Ecology, EPA, and DOE, 2003, *Hanford Federal Facility Agreement and Consent Order,* as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.

EPA, 1993, *Guidance on Conducting Non-Time Critical Removal Actions Under CERCLA,* EPA/540/F-94/009, U.S. Environmental Protection Agency, Washington D.C.

EPA, 1995, *Record of Decision, U.S. Department of Energy Hanford Environmental Restoration Disposal Facility, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

EPA, 2001, *Declaration of the Record of Decision for the 300-FF-2 Operable Unit,* U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

EPA,2005, *Action Memorandum #1 for the 300 Area Facilities* , U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

Endangered Species Act of 1973, 16 U.S.C. 1531, et seq.

Hazardous Materials Transportation Act of 1974, 49 U.S.C. 1801-1813, et seq.

Migratory Bird Treaty Act of 1918, 16 U.S.C. 703, et seq.

National Historic Preservation Act of 1966, 16 U.S.C. 470, et seq.

Native American Graves Protection and Repatriation Act of 1990, 25 U.S.C. 3001, et seq.

NPS, 1988, *The National Register of Historic Places,* National Park Service, U.S. Department of the Interior, Washington, D.C.

OMB, 1992, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs,* Circular A-94, Office of Management and Budget, Washington D.C.

RCW 70.94, "Washington Clean Air Act," *Revised Code of Washington* 70.94, as amended.

Resource Conservation and Recovery Act of 1976, 42 U.S.C. 6901, et seq.

Superfund Amendments and Reauthorization Act of 1986, Public Law 99-499, as amended.

Toxic Substances Control Act of 1976, 15 U.S.C. 2601, et seq.

WAC 173-216, "State Waste Discharge Permit Program", *Washington Administrative Code*, as amended.

WAC 173-218, "Underground Injection Control Program", *Washington Administrative Code*, as amended.

WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code*, as amended.

WAC 173-400, "General Regulations for Air Pollution Sources," *Washington Administrative Code*, as amended.

WAC 173-460, "Controls for New Sources of Toxic Air Pollutants," *Washington Administrative Code*, as amended.

WAC 173-480, "Ambient Air Quality Standards and Emission Limits for Radionuclides," *Washington Administrative Code*, as amended.

WAC 246-247, "Radiation Protection -- Air Emissions," *Washington Administrative Code*, as amended.

WAC 296-62, "General Occupational Health Standards," *Washington Administrative Code*, as amended.

Signature sheet for the Action Memorandum #2 for the Removal Action at the 300 Area Facilities between the U. S. Environmental Protection Agency and the U. S. Department of Energy

David T. Evans

David T. Evans, Acting Assistant Manager
for the River Corridor
Richland Operations Office
U. S. Department of Energy

4/4/06

Date

Signature sheet for the Action Memorandum #2 for the Removal Action at the 300 Area Facilities between the U. S. Environmental Protection Agency and the U. S. Department of Energy

Nick Ceto

Nick Ceto, Hanford Project Manager
U. S. Environmental Protection Agency

5-10-06

Date

APPENDIX A

RESPONSE TO PUBLIC COMMENTS ON THE ENGINEERING EVALUATION/COST ANALYSIS #2 FOR THE 300 AREA

Comments and Responses on the
Engineering Evaluation/Cost Analysis #2 for the 300 Area
DOE/RL-2005-84, Rev. 0

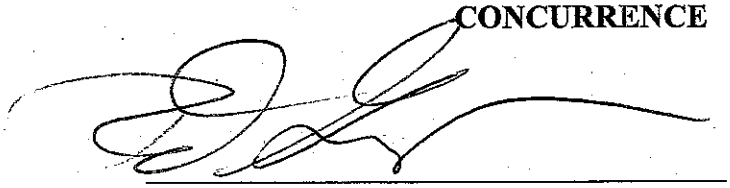
Richard Brandt:

1. **Comment (RB):** *My opinion regarding the 324 and 327 buildings at the 300 Site is to deactivate and demolish both of them as soon as posible. I am a retired chemist from both Purex and the 222-S Laboratories and was familiar with both buildings.*

   Response: Comment noted. Facility deactivation is planned to begin this summer.

WASTE MANAGEMENT PLAN FOR THE 324/ 327 D4 PROJECT

CONCURRENCE



Rudy Guercia
U.S. Department of Energy
Richland Operations Office

Larry Gadbois For

Alicia Boyd, Project Manager
U.S. Environmental Protection Agency

WASTE MANAGEMENT PLAN FOR THE 324/ 327 D4 PROJECT

This plan identifies guiding documents for waste management activities and requirements for the removal, staging, characterization, and disposal of legacy waste contained in the 324/ 327 facilities. The plan does not address waste management activities from the interior areas of the Hot Cells.

Waste management activities shall be performed in accordance with the waste management ARARs identified in the action memorandum for the 324/327 Buildings and ancillary facilities (EPA 2006). The expected waste streams include, but are not limited to, the following:

- Solid waste (nonradioactive, nondangerous waste)
- Low-level radioactive waste
- Hazardous and dangerous wastes
- Mixed waste (waste that is both low-level radioactive waste and hazardous waste)
- Asbestos waste
- PCB wastes

Waste Characterization and Designation

Waste generated will be characterized in accordance with the requirements of the receiving facility, and the approved 300 Area Waste Characterization SAP (DOE-RL 2005). Characterization will be conducted through process knowledge, sampling/analysis, and radiological surveys.

The data generated as part of waste characterization will be used to develop the following information (as applicable):

- Contaminant identification
- Contaminant concentrations
- Waste treatment requirements
- Waste packaging and disposal requirements
- Worker health and safety conditions
- Decontamination requirements
- Operational precautions
- Waste acceptance documents
- Transportation documents.

Waste Minimization

Waste minimization practices will be followed during all phases of waste management. Waste materials will be recycled, reused, or reclaimed when feasible. To be suitable for recycling or reuse, the materials in question must 1) be needed or in demand; 2) be able to meet the Hanford site free release criteria and 3) not result in an excessive cost to the government. The decision of whether or not the materials meet this criteria will be made by contractor management with input from technical personnel.

Introduction of clean materials into a contamination area and contamination of clean materials will be minimized to the extent practicable. During all phases of waste management, emphasis will be placed on source reduction to eliminate or minimize the volume of wastes that will be generated.

All materials released offsite for disposal/recycle must be certified free of radiological contamination in accordance with the contractor's material release procedures. Waste materials with no or de minimis levels of 300 Area CERCLA hazardous substance are not considered CERCLA waste and are therefore not subject to the 40 CFR 300.440 offsite acceptability determination.

Waste Handling, Storage, and Packaging

CERCLA Section 104(d)(4) states that where two or more noncontiguous facilities are reasonably related on the basis of geography or on the basis of the threat or potential threat to the public health or welfare or the environment, these facilities may be treated as one for the purposes of this section. The preamble to the "National Oil and Hazardous Substances Pollution Contingency Plan" (40 CFR 300) clarifies the stated EPA interpretation that when noncontiguous facilities are reasonably close to one another and wastes at these sites are compatible for a selected treatment or disposal approach, CERCLA Section 104(d)(4) allows the lead agency to treat these related facilities as one site for response purposes and, therefore, allows the lead agency to manage waste transferred between such noncontiguous facilities without obtaining a permit. The two facilities located outside of the action memorandum boundary shown in Figure 1 that are considered to be within the CERCLA onsite area for this removal action are the ERDF and the Industrial Hygiene Field Services Facility.

The Building Footprint Area (BFAs) for this removal action is defined to include the individual facility footprint and the surrounding area needed to support the staging of containers, packaging and equipment necessary to perform the deactivation of the facilities. Waste located within the BFA has not been generated and will not be subject to the requirements of WAC 173-303. The BFA is located within the onsite area. When waste leaves the BFA and enters the "onsite area" it becomes subject to the substantive portions of WAC 173-303. Substantive requirements are those regulations which address waste characterization, packaging, labeling and storage. Permits, documentation, reporting, time limits for waste storage and recordkeeping requirements are not applicable to either area. The CERCLA onsite area is defined as all other areas included in this removal action (see Figure 1).

While managing waste inside the BFA, safe and effective management practices shall be established to ensure protection of human health and the environment. Substantive provisions of waste management ARARs (i.e. packaging, container marking, etc.) may be used, when appropriate, within the BFA in this regard.

For the 324/327 Buildings and ancillary facilities addressed under this action, the onsite area is defined as the 300 Area (see Figure 1). Within the onsite area, only the substantive requirements of the ARARs apply.

Common Waste Handling, Storage, and Packaging Requirements.

The requirements in the following paragraphs are common to both the BFA and the onsite area.

- **Nonbulk** containers or packages (i.e. drums) of waste requiring tracking (e.g., hazardous, mixed) will be assigned a package identification number by a waste transportation specialist. Containers in poor condition will have the contents transferred to a container in good condition. Portable fire extinguishers and spill-control equipment will be available.

- **Bulk waste** will be placed in approved containers (i.e. bulk roll-off boxes) for ERDF disposal. The containers will be lined and covered (as appropriate). While wastes are being stored and if there is a potential for release, they will be managed in a manner (i.e. covered containers, wrapped in plastic, fixatives applied, etc.) that eliminates the threat of release of materials. Lightweight material (e.g., paper and plastic) will be bagged, if appropriate, prior to placement in the container to eliminate the potential of the materials blowing out of the container.
  All containers, packages, or items requiring storage in a radioactive materials area will be marked/labeled with radioactive material markings. Containers will be appropriately labeled and/or marked in accordance with all applicable requirements. Containers will be stored to prevent the accumulation of water.

Specific Waste Handling, Storage, and Packaging Requirements. The following specific requirements apply only in the onsite area (outside the BFA) for the variety of wastes that may be encountered during the removal action.

- **Solid Waste.** Nondangerous solid waste will be managed in accordance with WAC 173-350, with an emphasis on recycling. Management under WAC 173-303 is addressed in the Hazardous/Dangerous Waste subsection. Recyclable wastes (e.g., lead, aerosols, and fluorescent light tubes) should be managed in accordance with the management plan for recyclable materials administered by the Hanford Site's CCRC. All materials released offsite for disposal, recycle, or salvage must be certified as free of radioactive contamination in accordance with the contractor's material release procedures. Demolition debris will be sized in accordance with the waste acceptance criteria of the disposal facility. Additionally, materials containing CERCLA hazardous substances (unless present in de minimis concentrations) may only be released to an offsite facility that has received approval from EPA in accordance with 40 CFR 300.440.
- **Low-Level Radioactive Waste.** Liquids will be collected in appropriate containers. Dependant upon volume and characteristics (e.g., pH, oils, waste codes), containers will vary from drums to bulk holding tanks. Low level bulk waste will (in most cases) be shipped to ERDF via roll off boxes or containers.

- **Hazardous/Dangerous Waste.** Hazardous/dangerous waste managed outside of the BFA will be packaged and stored to prevent dispersion and public exposures as required by WAC 173-303. Management of hazardous/dangerous waste may include storage within onsite container storage areas operated in accordance with the substantive provisions of WAC 173-303-630. The substantive provisions of 173-303-630, which apply to storage of hazardous waste within the CERCLA onsite area includes the following sections: 2, 3, 4, 5, 7(c) (non-liquid wastes), 8, 9, 10 and 11. Section 6 applies with the exception of the log keeping requirements. Section 7(a) and (b) are applicable to the storage of liquid dangerous waste.

- **Mixed Waste.** Mixed waste will be managed in compliance with the substantive requirements for both hazardous/dangerous wastes and radioactive waste in accordance the contractor work control documents. Requirements associated with the characterization; packagings, labeling, etc. are the same as those for hazardous/ dangerous waste. Storage, pending final disposal, will be allowed at the Hanford Site's CWC per the offsite approval granted by the EPA (EPA 2002) in accordance with 40 CFR 300.440.

- **Asbestos.** Multiple forms of asbestos are expected to be encountered. Removal and disposal of asbestos and ACM are regulated under the *Clean Air Act Amendments of 1977* (40 CFR 61, Subpart M) and under health and safety regulations promulgated pursuant to the OSHA regulations (29 CFR 1910.1001 and WAC 296-62 Part I). The 40 CFR 61 requirements applicable to this removal action are contained in 40 CFR 61.145(c) and 40 CFR 61.150. These regulations establish removal requirements based on quantity present and handling requirements. These regulations also specify handling, packaging, and disposal requirements for regulated sources having the potential to release asbestos fibers.

The substantive requirements of the *Clean Air Act Amendments of 1977* standards are applicable to the abatement of asbestos and ACM. Both the substantive and administrative requirements of the OSHA standards are applicable to the removal of asbestos and ACM. Asbestos is further discussed in work-specific documents.

- **PCBs.** PCBs are identified as potential contaminants in the 300 Area facilities, and PCB-contaminated waste may be generated. The various waste matrixes that may contain PCBs include PCB oils, PCB solids in paint, PCB remediation waste, and PCB-contaminated items. Staging of PCB waste at the 300 Area facilities must be done in a manner that satisfies substantive provisions of 40 CFR 761.65(b). PCB bulk product waste or remediation waste will be managed within the BFA or the onsite area. PCB liquids may be managed within the facility of origination or a centralized area within the CERCLA onsite area (following approval of a centralized area by the EPA). Outside the BFA, containers will be marked with a M_L marking (CAUTION – CONTAINS PCBs) as required by the TSCA.

  Areas outside the BFA containing packaged PCBs will be marked with signs posting "DANGER-UNAUTHORIZED PERSONNEL KEEP OUT" at each entrance. The M_L marking will also be posted in accordance with 40 CFR 761. The use of an "overpack" container is acceptable for outside storage. Although the "overpack" containers may not represent the typical concept of a "facility," they satisfy the substantive requirements for roof, walls, nonporous floors, and spill protection.

- **Liquid Waste.** Qualifying liquid waste may be treated and disposed of at ERDF. All liquid waste disposed of at a location other than ERDF must first be approved by the EPA. The ERDF is not allowed to dispose of unstabilized liquid waste. Possible treatment locations include the ETF or a facility outside of the Hanford Site.

Applicable DOT requirements will be followed for all materials/ waste during transport occurring on public roads and highways.

Waste Treatment

Several mixed waste streams have already been reviewed and approved for treatment and disposal at ERDF. These mixed waste streams are as follows:

- Radioactively contaminated elemental mercury may be amalgamated.
- Radioactively contaminated elemental lead or hazardous debris may be macroencapsulated at ERDF.
- Aqueous solutions may be treated in accordance with an EPA-approved waste treatment plan and sent to ERDF.
- Stabilization of soils contaminated with lead or other heavy metals may be treated at ERDF.

- PCB waste requiring treatment will be treated in accordance with the requirements identified in 40 CFR 761.

The above-listed waste streams will be treated as they are encountered, and the contractor will notify the DOE and regulatory agencies via e-mail. If waste is encountered that requires treatment outside of the methods mentioned above, approval will be sought from EPA via an approved treatment plan.

Waste Transportation and Shipping

All shipments will be made in accordance with U.S. Department of Transportation regulations, 49 CFR 171-179, WAC 173-303, and the contractor's waste transportation procedures, as applicable.

The removal action may require offsite transportation of wastes and potentially contaminated samples. The offsite handling and shipping of wastes and potentially contaminated samples will be in accordance with the *Hazardous Materials Transportation Act of 1974*, as implemented through 49 CFR 100 through 179.

Disposal

All waste resulting from this action will be evaluated to determine if the waste meets ERDF waste acceptance criteria for disposal. CERCLA waste disposed of at any disposal facility other than ERDF requires EPA approval in accordance with 40 CFR 300.440. Any PCB waste that does not meet ERDF waste acceptance criteria may be transported for disposal to a TSCA offsite disposal facility following the receipt of an offsite acceptability determination by the EPA.

Solid waste may be sent for offsite disposal at a municipal/industrial landfill. Disposal of materials containing no or de minimis levels of CERCLA hazardous substances would not require an offsite acceptability determination per 40 CFR 300.440.

References

DOE-RL, 2005, *300 Area D&D Waste Sampling and Analysis Plan*, DOE/RL-2004-84, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

EPA, 2006, *Action Memorandum #2 for 324/327 Buildings and Ancillary Facilities*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

EPA, 2002, *CERCLA Off-Site Acceptability Determination*, EPA ID #WA7 89000 8967, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

Figure 1. 324/ 327 Map.